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1 [Nonorthogonal decomposition of binary matrices for bounded-error data compression and analysis](#)



Mehmet Koyutürk, Ananth Grama, Naren Ramakrishnan

March 2006 **ACM Transactions on Mathematical Software (TOMS)**, Volume 32 Issue 1

Publisher: ACM Press

Full text available: [pdf\(1.07 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This article presents the design and implementation of a software tool, PROXIMUS, for error-bounded approximation of high-dimensional binary attributed datasets based on nonorthogonal decomposition of binary matrices. This tool can be used for analyzing data arising in a variety of domains ranging from commercial to scientific applications. Using a combination of innovative algorithms, novel data structures, and efficient implementation, PROXIMUS demonstrates excellent accuracy, performance, and ...

Keywords: Compressing binary-valued vectors, nonorthogonal matrix decompositions, semidiscrete decomposition

2 [Modeling: PNORMS: platonic derived normals for error bound compression](#)



João Fradinho Oliveira, Bernard Francis Buxton

November 2006 **Proceedings of the ACM symposium on Virtual reality software and technology VRST '06**

Publisher: ACM Press

Full text available: [pdf\(3.97 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

3D models of millions of triangles invariably repeatedly use the same 12-byte unit normals. Several bit-wise compression algorithms exist for efficient storage and progressive transmission and visualization of normal vectors. However such methods often incur a reconstruction time penalty which, in the absence of dedicated hardware acceleration, make real-time rendering with such compression/reconstruction methods prohibitive. In particular, several methods use a subdivided octahedron to create l ...

Keywords: colour compression, error bound, normal compression, run-time encoding

3 [Bounded-error compression of particle data from hierarchical approximate methods](#)



Dow-Yung Yang, Ananth Grama, Vivek Sarin

January 1999 **Proceedings of the 1999 ACM/IEEE conference on Supercomputing (CDROM) Supercomputing '99**

Publisher: ACM Press

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4 [Bounded-error compression of particle data from hierarchical approximate methods](#)



Dow-Yung Yang, Ananth Grama, Vivek Sarin

January 1999 **Proceedings of the 1999 ACM/IEEE conference on Supercomputing (CDROM) Supercomputing '99**

Publisher: ACM Press

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Relevance scale ☐ ☐ ☐ ☐ ☐**1 Sample compression bounds for decision trees**

Mohak Shah

June 2007

Proceedings of the 24th international conference on Machine learning ICML '07**Publisher:** ACM PressFull text available: [pdf\(232.56 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#)

We propose a formulation of the Decision Tree learning algorithm in the Compression settings and derive tight generalization error bounds. In particular, we propose Sample Compression and Occam's Razor bounds. We show how such bounds, unlike the VC dimension or Rademacher complexities based bounds, are more general and can also perform a margin-sparsity trade-off to obtain better classifiers. Potentially, these risk bounds can also guide the model selection process and replace traditional prun ...

2 Nonorthogonal decomposition of binary matrices for bounded-error data compression and analysis

Mehmet Koyutürk, Ananth Grama, Naren Ramakrishnan

March 2006 **ACM Transactions on Mathematical Software (TOMS)**, Volume 32 Issue 1**Publisher:** ACM PressFull text available: [pdf\(1.07 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This article presents the design and implementation of a software tool, PROXIMUS, for error-bounded approximation of high-dimensional binary attributed datasets based on nonorthogonal decomposition of binary matrices. This tool can be used for analyzing data arising in a variety of domains ranging from commercial to scientific applications. Using a combination of innovative algorithms, novel data structures, and efficient implementation, PROXIMUS demonstrates excellent accuracy, performance, and ...

Keywords: Compressing binary-valued vectors, nonorthogonal matrix decompositions, semidiscrete decomposition

3 Bounded-error compression of particle data from hierarchical approximate methods

Dow-Yung Yang, Ananth Grama, Vivek Sarin

January 1999 **Proceedings of the 1999 ACM/IEEE conference on Supercomputing (CDROM) Supercomputing '99****Publisher:** ACM PressFull text available: [pdf\(691.10 KB\)](#)Additional Information: [full citation](#), [references](#), [index terms](#)**4 Bounded-error compression of particle data from hierarchical approximate methods**

Dow-Yung Yang, Ananth Grama, Vivek Sarin

January 1999 **Proceedings of the 1999 ACM/IEEE conference on Supercomputing (CDROM) Supercomputing '99****Publisher:** ACM PressFull text available: [pdf\(691.10 KB\)](#)Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)


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1 [Multi-dimensional trees for controlled volume rendering and compression](#)

Jane Wilhelms, Allen Van Gelder

 October 1994 **Proceedings of the 1994 symposium on Volume visualization VVS '94**

Publisher: ACM Press

Full text available: pdf(2.01 MB)

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2 [Course 4: State of the art in massive model visualization: Efficient data reduction and cache-coherent techniques toward real-time performance](#)

Dave Kasik

 August 2007 **ACM SIGGRAPH 2007 courses SIGGRAPH '07**

Publisher: ACM Press

Full text available: pdf(11.81 MB)

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3 [Energy-aware lossless data compression](#)

Kenneth C. Barr, Krste Asanović

 August 2006 **ACM Transactions on Computer Systems (TOCS)**, Volume 24 Issue 3

Publisher: ACM Press

Full text available: pdf(873.90 KB)

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Wireless transmission of a single bit can require over 1000 times more energy than a single computation. It can therefore be beneficial to perform additional computation to reduce the number of bits transmitted. If the energy required to compress data is less than the energy required to send it, there is a net energy savings and an increase in battery life for portable computers. This article presents a study of the energy savings possible by losslessly compressing data prior to transmission. A ...

Keywords: Compression, energy-aware, lossless, low-power, power-aware

4 [Modeling for text compression](#)

Timothy Bell, Ian H. Witten, John G. Cleary

 December 1989 **ACM Computing Surveys (CSUR)**, Volume 21 Issue 4

Publisher: ACM Press

Full text available: pdf(3.54 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The best schemes for text compression use large models to help them predict which characters will come next. The actual next characters are coded with respect to the prediction, resulting in compression of information. Models are best formed adaptively, based on the text seen so far. This paper surveys successful strategies for adaptive modeling that are suitable for use in practical text compression systems. The strategies fall into three main classes: finite-context modeling, i ...

5 [Level set and PDE methods for computer graphics](#)

David Breen, Ron Fedkiw, Ken Museth, Stanley Osher, Guillermo Sapiro, Ross Whitaker

 August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**

Publisher: ACM Press

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1 [Predicting whole-program locality through reuse distance analysis](#)

Chen Ding, Yutao Zhong

May 2003 **ACM SIGPLAN Notices , Proceedings of the ACM SIGPLAN 2003 conference on Programming language design and implementation PLDI '03**, Volume 38 Issue 5

Publisher: ACM Press

Full text available: [pdf\(297.60 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Profiling can accurately analyze program behavior for select data inputs. We show that profiling can also predict program locality for inputs other than profiled ones. Here locality is defined by the distance of data reuse. Studying whole-program data reuse may reveal global patterns not apparent in short-distance reuses or local control flow. However, the analysis must meet two requirements to be useful. The first is efficiency. It needs to analyze all accesses to all data elements in full-size ...

Keywords: data locality, pattern recognition, prediction, profiling, program locality, reuse distance, sampling, stack distance, training

2 [On randomization in sequential and distributed algorithms](#)

Rajiv Gupta, Scott A. Smolka, Shaji Bhaskar

March 1994 **ACM Computing Surveys (CSUR)**, Volume 26 Issue 1

Publisher: ACM Press

Full text available: [pdf\(8.01 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Probabilistic, or randomized, algorithms are fast becoming as commonplace as conventional deterministic algorithms. This survey presents five techniques that have been widely used in the design of randomized algorithms. These techniques are illustrated using 12 randomized algorithms—both sequential and distributed—that span a wide range of applications, including: primality testing (a classical problem in number theory), interactive probabilistic proof s ...

Keywords: Byzantine agreement, CSP, analysis of algorithms, computational complexity, dining philosophers problem, distributed algorithms, graph isomorphism, hashing, interactive probabilistic proof systems, leader election, message routing, nearest-neighbors problem, perfect hashing, primality testing, probabilistic techniques, randomized or probabilistic algorithms, randomized quicksort, sequential algorithms, transitive tournaments, universal hashing

3 [Dynamic ordered sets with exponential search trees](#)

Arne Andersson, Mikkel Thorup

June 2007 **Journal of the ACM (JACM)**, Volume 54 Issue 3

Publisher: ACM Press

Full text available: [pdf\(345.23 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We introduce exponential search trees as a novel technique for converting static polynomial space search structures for ordered sets into fully-dynamic linear space data structures.

This leads to an *optimal* bound of $O(\sqrt{\log n / \log \log n})$ for searching and updating a dynamic set X of n integer keys in linear space. Searching X for an integer y means finding the maximum key in X which is smaller than or equal to y

Keywords: Search trees, ordered lists


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» Key

IEEE JNL IEEE Journal or Magazine

IET JNL IET Journal or Magazine

IEEE CNF IEEE Conference Proceeding

IET CNF IET Conference Proceeding

IEEE STD IEEE Standard

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